Design a Solar Sail Mission To the Sun, Comet or Asteroid

A Candidate 2005 NASA Academy Group Project

ACTIVITIES:

Select the scientific problem to be studied (E.g., what solar, cometary or asteroidal characteristics or properties to study at close range);

Determine the set of instruments required (cameras, spectrometers, in-situ, etc.);

Determine the basic design of the spacecraft required to support the investigation (power, data, pointing, thermal control, overall mass and volume, etc.);

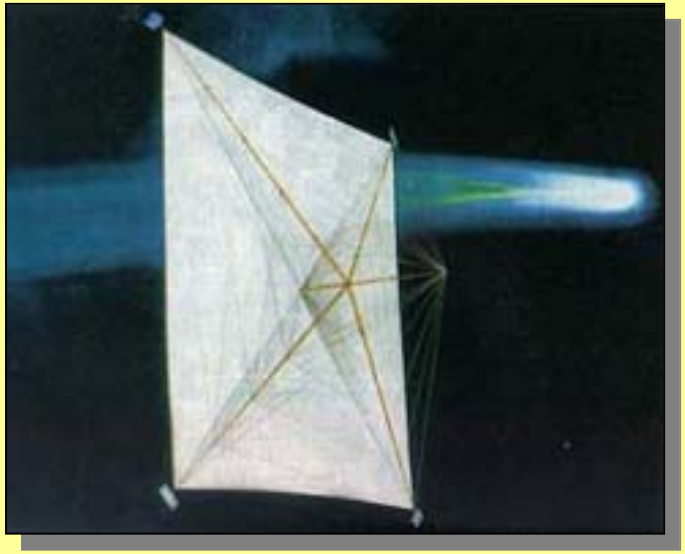
Design a solar sail to deliver the package to the desired location (based on overall mass, time constraints, other mission requirements);

Determine mission supporting infrastructure required (launcher, ground systems, operations, communications and data handling);

Define schedule and mission costs.

DISCIPLINES INVOLVED:

Science (solar, heliospheric, cometary, geologic); **Instruments**; **Spacecraft Design** (power, data, ACS, thermal, mechanical); **Astrodymanics** (use of existing/provided software); **Ground System Design** (communications/data handling, operations, launch systems); **Mission Development** (scheduling, costing, selling).



Assumptions/Mission Constraints:

GSFC PI will provide solar sail references and basics, current sail design information, and solar sail astrodynamics software and instruction.

Payload (spacecraft and instruments) mass must be traded against sail size to allow reasonable flight times using a reasonable sail design.

A cost cap, commensurate with the class of the mission, will be established.